



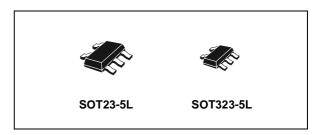
SINGLE BUS BUFFER (3-STATE)

- HIGH SPEED: $t_{PD} = 3.4$ ns (TYP.) at $V_{CC} = 5$ V
- LOW POWER DISSIPATION: $I_{CC} = 1\mu A(MAX.)$ at $T_A=25^{\circ}C$
- HIGH NOISE IMMUNITY: V_{NIH} = V_{NIL} = 28% V_{CC} (MIN.)
- POWER DOWN PROTECTION ON INPUTS
- SYMMETRICAL OUTPUT IMPEDANCE: |I_{OH}| = I_{OL} = 8mA (MIN) at V_{CC} = 4.5V
- BALANCED PROPAGATION DELAYS: tplh ≅ tphl
- OPERATING VOLTAGE RANGE:
 V_{CC}(OPR) = 2V to 5.5V
- IMPROVED LATCH-UP IMMUNITY

DESCRIPTION

The 74V1G126 is an advanced high-speed CMOS SINGLE BUS BUFFER fabricated with sub-micron silicon gate and double-layer metal wiring C²MOS technology.

3-STATE control input 1G has to be set LOW to place the output into the high impedance state.

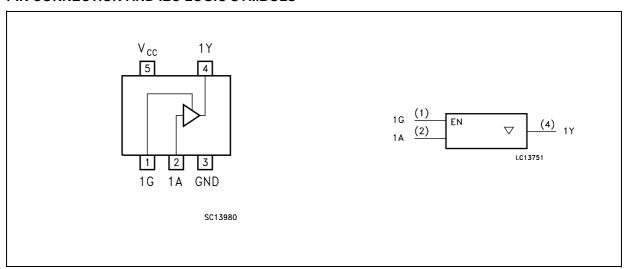


ORDER CODES

| PACKAGE | T&R |
|-----------|-------------|
| SOT23-5L | 74V1G126STR |
| SOT323-5L | 74V1G126CTR |

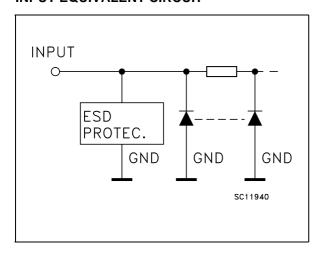
Power down protection is provided on all inputs and 0 to 7V can be accepted on inputs with no regard to the supply voltage. This device can be used to interface 5V to 3V.

PIN CONNECTION AND IEC LOGIC SYMBOLS



April 2004 1/10

INPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

| PIN N° | SYMBOL | NAME AND FUNCTION |
|--------|-----------------|-------------------------|
| 1 | 1G | Output Enable Input |
| 2 | 1A | Data Input |
| 4 | 1Y | Data Output |
| 3 | GND | Ground (0V) |
| 5 | V _{CC} | Positive Supply Voltage |

TRUTH TABLE

| Α | G | Y |
|---|---|---|
| Х | L | Z |
| L | Н | L |
| Н | Н | Н |

X : Don't Care Z : High Impedance

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-------------------------------------|--------------------------------------|-------------------------------|------|
| V _{CC} | Supply Voltage | -0.5 to +7.0 | V |
| V _I | DC Input Voltage | -0.5 to +7.0 | V |
| Vo | DC Output Voltage | -0.5 to V _{CC} + 0.5 | V |
| I _{IK} | DC Input Diode Current | - 20 | mA |
| I _{OK} | DC Output Diode Current | ± 20 | mA |
| Ι _Ο | DC Output Current | ± 25 | mA |
| I _{CC} or I _{GND} | DC V _{CC} or Ground Current | ± 50 | mA |
| T _{stg} | Storage Temperature | -65 to +150 | °C |
| TL | Lead Temperature (10 sec) | 260 | °C |

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Value | Unit |
|-----------------|---|----------------------|--------------|
| V _{CC} | Supply Voltage | 2 to 5.5 | V |
| V _I | Input Voltage | 0 to 5.5 | V |
| Vo | Output Voltage | 0 to V _{CC} | V |
| T _{op} | Operating Temperature | -55 to 125 | °C |
| dt/dv | Input Rise and Fall Time (note 1) ($V_{CC} = 3.3 \pm 0.3 V$) ($V_{CC} = 5.0 \pm 0.5 V$) | 0 to 100 0 to 20 | ns/V ns/V |

1) $V_{\rm IN}$ from 30% to 70% of $V_{\rm CC}$

DC SPECIFICATIONS

| | | Т | est Condition | Value | | | | | | | |
|-----------------|---|-----------------|--|--------------------------|------|--------------------|--------------------|--------------------|--------------------|--------------------|------|
| Symbol | Parameter | v _{cc} | | T _A = 25°C -4 | | | | 85°C | -55 to | 125°C | Unit |
| | | (V) | | Min. | Тур. | Max. | Min. | Max. | Min. | Max. | |
| V _{IH} | High Level Input | 2.0 | | 1.5 | | | 1.5 | | 1.5 | | |
| | Voltage | 3.0 to 5.5 | | 0.7V _{CC} | | | 0.7V _{CC} | | 0.7V _{CC} | | V |
| V _{IL} | Low Level Input | 2.0 | | | | 0.5 | | 0.5 | | 0.5 | |
| | Voltage | 3.0 to 5.5 | | | | 0.3V _{CC} | | 0.3V _{CC} | | 0.3V _{CC} | V |
| V _{OH} | High Level Output | 2.0 | I _O =-50 μA | 1.9 | 2.0 | | 1.9 | | 1.9 | | |
| | Voltage | 3.0 | I _O =-50 μA | 2.9 | 3.0 | | 2.9 | | 2.9 | | V |
| | | 4.5 | I _O =-50 μA | 4.4 | 4.5 | | 4.4 | | 4.4 | | |
| | | 3.0 | I _O =-4 mA | 2.58 | | | 2.48 | | 2.4 | | |
| | | 4.5 | I _O =-8 mA | 3.94 | | | 3.8 | | 3.7 | | |
| V _{OL} | Low Level Output | 2.0 | I _O =50 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | |
| | Voltage | 3.0 | I _O =50 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | |
| | | 4.5 | I _O =50 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | V |
| | | 3.0 | I _O =4 mA | | | 0.36 | | 0.44 | | 0.55 | |
| | | 4.5 | I _O =8 mA | | | 0.36 | | 0.44 | | 0.55 | |
| I _{OZ} | High Impedance Output Leakage Current | 5.5 | $V_I = V_{IH} \text{ or } V_{IL}$ $V_O = V_{CC} \text{ or GND}$ | | | ±0.25 | | ± 2.5 | | ± 5 | μΑ |
| Ι _Ι | Input Leakage Current | 0 to 5.5 | V _I = 5.5V or GND | | | ± 0.1 | | ± 1 | | ± 1 | μΑ |
| I _{CC} | Quiescent Supply Current | 5.5 | $V_I = V_{CC}$ or GND | | | 1 | | 10 | | 20 | μΑ |

AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3 \text{ns}$)

| | | ٦ | Test Condition | | Value | | | | | | | |
|-------------------------------------|---------------------|---------------------|----------------|--|-------|-----------------------|------|------|------|--------------|------|------|
| Symbol | Parameter | v _{cc} | CL | | Т | T _A = 25°C | | | 85°C | -55 to 125°C | | Unit |
| | | (V) | (pF) | | Min. | Тур. | Max. | Min. | Max. | Min. | Max. | |
| t _{PLH} | Propagation Delay | 3.3 ^(*) | 15 | | | 4.7 | 7.5 | 1.0 | 8.5 | 1.0 | 9.5 | |
| t _{PHL} | Time | 3.3 ^(*) | 50 | | | 5.2 | 8.0 | 1.0 | 9.5 | 1.0 | 10.5 | ns |
| | | 5.0 ^(**) | 15 | | | 3.4 | 5.5 | 1.0 | 6.5 | 1.0 | 7.5 | 115 |
| | | 5.0 ^(**) | 50 | | | 3.7 | 6.5 | 1.0 | 7.5 | 1.0 | 8.5 | |
| t _{PLZ} | Output Disable | 3.3 ^(*) | 15 | | | 4.4 | 8.0 | 1.0 | 9.0 | 1.0 | 10.0 | |
| t _{PHZ} | Time | 3.3 ^(*) | 50 | | | 4.8 | 11.5 | 1.0 | 12.5 | 1.0 | 13.5 | ns |
| | | 5.0 ^(**) | 15 | | | 3.0 | 5.0 | 1.0 | 6.0 | 1.0 | 7.0 | 115 |
| | | 5.0(**) | 50 | | | 3.2 | 7.0 | 1.0 | 8.0 | 1.0 | 9.0 | |
| | | 3.3 ^(*) | 15 | | | 4.8 | 7.6 | 1.0 | 9.5 | 1.0 | 10.5 | |
| t _{PZL} Output Enable Time | 3.3 ^(*) | 50 | | | 5.3 | 8.5 | 1.0 | 10.0 | 1.0 | 11.0 | ns | |
| | 5.0 ^(**) | 15 | | | 3.6 | 5.9 | 1.0 | 7.0 | 1.0 | 8.0 | 115 | |
| | | 5.0 ^(**) | 50 | | | 3.9 | 6.5 | 1.0 | 7.5 | 1.0 | 8.5 | |

^(*) Voltage range is 3.3V ± 0.3V (**) Voltage range is 5.0V ± 0.5V

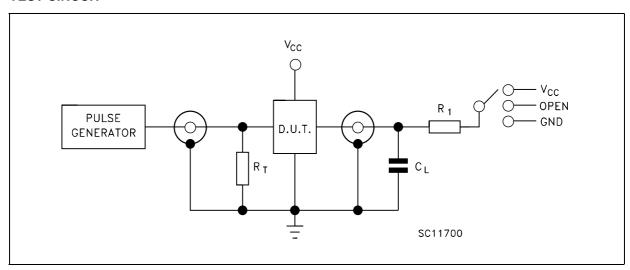
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CAPACITIVE CHARACTERISTICS

| | | Test Condition | | | | | | | | |
|------------------|--|----------------|------|-----------------------|------|------|-------------|------|--------------|----|
| Symbol | Parameter | | T, | T _A = 25°C | | | -40 to 85°C | | -55 to 125°C | |
| | | | Min. | Тур. | Max. | Min. | Max. | Min. | Max. | |
| C _{IN} | Input Capacitance | | | 4 | 10 | | 10 | | 10 | pF |
| C _{OUT} | Output Capacitance | | | 10 | | | | | | pF |
| C _{PD} | Power Dissipation Capacitance (note 1) | | | 10 | | | | | | pF |

¹⁾ C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. I_{CC(opr)} = C_{PD} x V_{CC} x f_{IN} + I_{CC}

TEST CIRCUIT

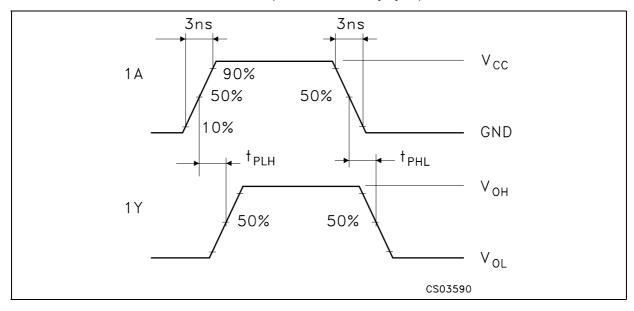


| TEST | SWITCH |
|-------------------------------------|-----------------|
| t _{PLH} , t _{PHL} | Open |
| t _{PZL} , t _{PLZ} | V _{CC} |
| t _{PZH} , t _{PHZ} | GND |

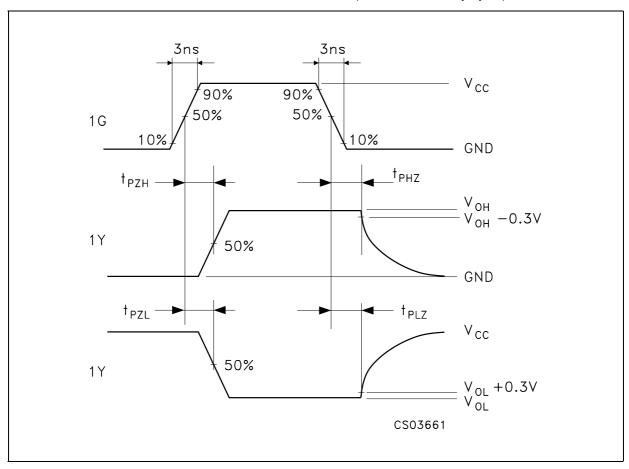
 C_L =15/50pF or equivalent (includes jig and probe capacitance) R1 = 1K Ω or equivalent R_T = Z_{OUT} of pulse generator (typically 50 Ω)

47/ 4/10

WAVEFORM 1: PROPAGATION DELAYS (f=1MHz; 50% duty cycle)

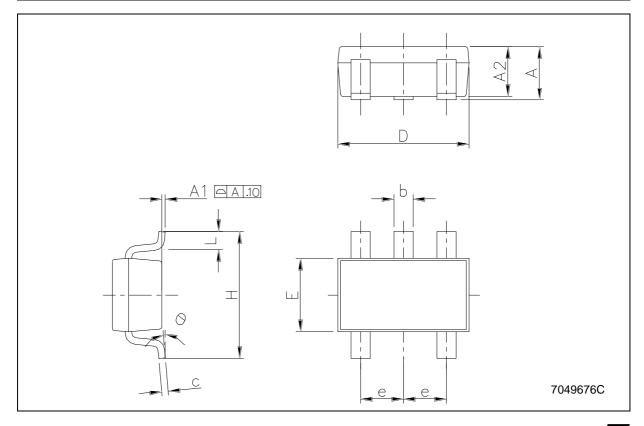


WAVEFORM 2: OUTPUT ENABLE AND DISABLE TIME (f=1MHz; 50% duty cycle)



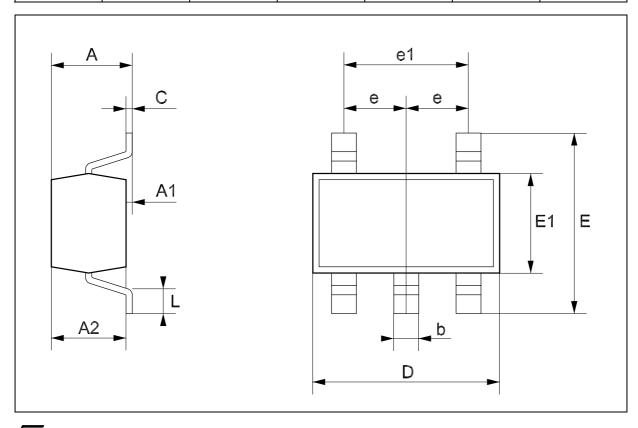
SOT23-5L MECHANICAL DATA

| DIM. | | mm. | | mils | | | | |
|-------|------|------|------|-------|------|-------|--|--|
| DIWI. | MIN. | TYP | MAX. | MIN. | TYP. | MAX. | | |
| Α | 0.90 | | 1.45 | 35.4 | | 57.1 | | |
| A1 | 0.00 | | 0.10 | 0.0 | | 3.9 | | |
| A2 | 0.90 | | 1.30 | 35.4 | | 51.2 | | |
| b | 0.35 | | 0.50 | 13.7 | | 19.7 | | |
| С | 0.09 | | 0.20 | 3.5 | | 7.8 | | |
| D | 2.80 | | 3.00 | 110.2 | | 118.1 | | |
| Е | 1.50 | | 1.75 | 59.0 | | 68.8 | | |
| е | | 0.95 | | | 37.4 | | | |
| Н | 2.60 | | 3.00 | 102.3 | | 118.1 | | |
| L | 0.10 | | 0.60 | 3.9 | | 23.6 | | |

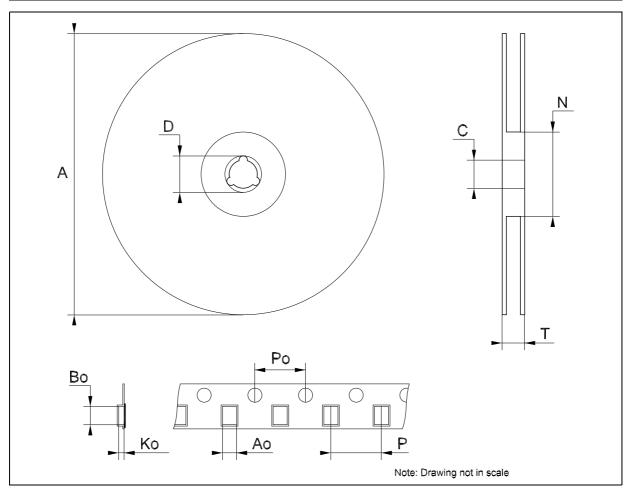


SOT323-5L MECHANICAL DATA

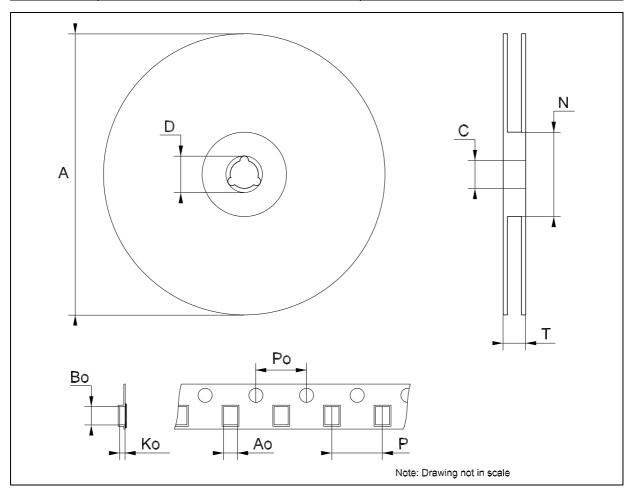
| DIM | | mm. | | mils | | | | |
|------|------|-------|------|------|------|------|--|--|
| DIM. | MIN. | TYP | MAX. | MIN. | TYP. | MAX. | | |
| А | 0.80 | | 1.10 | 31.5 | | 43.3 | | |
| A1 | 0.00 | | 0.10 | 0.0 | | 3.9 | | |
| A2 | 0.80 | | 1.00 | 31.5 | | 39.4 | | |
| b | 0.15 | | 0.30 | 5.9 | | 11.8 | | |
| С | 0.10 | | 0.18 | 3.9 | | 7.1 | | |
| D | 1.80 | | 2.20 | 70.9 | | 86.6 | | |
| E | 1.80 | | 2.40 | 70.9 | | 94.5 | | |
| E1 | 1.15 | | 1.35 | 45.3 | | 53.1 | | |
| е | | 0 .65 | | | 25.6 | | | |
| e1 | | 1.3 | | | 51.2 | | | |
| L | 0.10 | | 0.30 | 3.9 | | 11.8 | | |



| DIM. | mm. | | | inch | | |
|------|------|------|------|-------|-------|--------|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| А | | | 180 | | | 7.086 |
| С | 12.8 | 13.0 | 13.2 | 0.504 | 0.512 | 0.519 |
| D | 20.2 | | | 0.795 | | |
| N | 60 | | | 2.362 | | |
| Т | | | 14.4 | | | 0.567 |
| Ao | 3.13 | 3.23 | 3.33 | 0.123 | 0.127 | 0.131 |
| Во | 3.07 | 3.17 | 3.27 | 0.120 | 0.124 | 0.128 |
| Ko | 1.27 | 1.37 | 1.47 | 0.050 | 0.054 | 0.0.58 |
| Po | 3.9 | 4.0 | 4.1 | 0.153 | 0.157 | 0.161 |
| Р | 3.9 | 4.0 | 4.1 | 0.153 | 0.157 | 0.161 |



| DIM. | mm. | | | inch | | |
|------|------|------|------|-------|-------|-------|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| А | 175 | 180 | 185 | 6.889 | 7.086 | 7.283 |
| С | 12.8 | 13 | 13.2 | 0.504 | 0.512 | 0.519 |
| D | 20.2 | | | 0.795 | | |
| N | 59.5 | 60 | 60.5 | | 2.362 | |
| Т | | | 14.4 | | | 0.567 |
| Ao | | 2.25 | | | 0.088 | |
| Во | | 2.7 | | | 0.106 | |
| Ko | | 1.2 | | | 0.047 | |
| Ро | 3.9 | 4 | 4.1 | 0.153 | 0.157 | 0.161 |
| Р | 3.8 | 4 | 4.2 | 0.149 | 0.157 | 0.165 |



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